(2)

UNITED STATES ARMY HEALTH CARE STUDIES AND CLINICAL INVESTIGATION ACTIVITY

THE DENTAL NEEDS OF ARMY FAMILY MEMBERS, 1986
PILOT STUDY

MAJ(P) Michael C. Chisick
LTC Richard D. Guerin
COL Jay D. Shulman

Report # DR90-002

10 May 1990

UNITED STATES ARMY
HEALTH SERVICES COMMAND
FORT SAM HOUSTON, TEXAS 78234

NOTICE

The findings in this report are
not to be construed as an official
Department of the Army position
unless so designated by other
authorized documents.

* * * * * * * * * * * * *

Regular users of services of the Defense Technical Information Center (per DOD Instruction 5200.21) may purchase copies directly from the following:

Defense Technical Information Center (DTIC)
ATTN: DTIC-DDR
Cameron Station
Alexandria, VA 22304-6145

Telephones: AUTOVON (108) 284-7633, 4, or 5
COMMERCIAL (202) 274-7633, 4, or 5

All other requests for these reports will be directed to the following:

U.S. Department of Commerce
National Technical Information Services (NTIS)
5285 Port Royal Road
Springfield, VA 22161

Telephone: COMMERCIAL (703) 487-4600

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION / AVAILABILITY OF REPORT approved for public release distribution unlimited
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) DR90-002	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION US Army Health Care Studies & Clinical Investigation Activity 6b. OFFICE SYMBOL (If applicable) HSHN-D	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code) Fort Sam Houston, TX 78234-6060	7b. ADDRESS (City, State, and ZIP Code)
8a. NAME OF FUNDING / SPONSORING ORGANIZATION 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO / WORK UNIT ACCESSION NO

11. TITLE (Include Security Classification)

(U) The Dental Needs of Army Family Members, 1986: Pilot Study

12. PERSONAL AUTHOR(S)
MAJ(P) Michael C. Chisick; LTC Richard D. Guerin; COL Jay D. Shulman

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Final	FROM Sep 86 TO Nov 86	1990 May 10	71

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Dental utilization; dental utiliaation behavior

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

(U) This document provides a description of the methods used with the 1986 pilot study of the health of Army family members, the characteristics of the study sample, their dental treatment needs, their dental utilization behavior, their reaction to a hypothetical DoD sponsored dental insurance plan, and cost estimate for treating their dental needs.

20. DISTRIBUTION / AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION Unclassified
22a. NAME OF RESPONSIBLE INDIVIDUAL Maj(P) Michael C. Chisick	22b. TELEPHONE (Include Area Code) 512 221-6028 22c. OFFICE SYMBOL HSHN-D

DD FORM 1473, 84 MAR 83 APR edition may be used until exhausted
All other editions are obsolete

THE DENTAL NEEDS OF ARMY FAMILY MEMBERS, 1986

PILOT STUDY

MICHAEL C. CHISICK, MAJ, DC
RICHARD D. GUERIN, LTC, DC
JAY D. SHULMAN, COL, DC

(revised March 1987)

U.S. ARMY HEALTH CARE STUDIES AND
CLINICAL INVESTIGATION ACTIVITY

DENTAL STUDIES DIVISION

THE DENTAL NEEDS OF ARMY FAMILY MEMBERS, 1986

PILOT STUDY

TABLE OF CONTENTS

Executive Summary

This report presents the results of the analyses of data from the 1986 pilot study of the Dental Needs of Army Family Members. Data was collected on 825 dependent spouses and 850 dependent children (grades K-12). Five study sites were chosen to collect data on spouses (Ft. Sill, Oklahoma; Ft. Carson, Colorado; Ft. Polk, Louisiana; Ft. Riley, Kansas; and Ft. Leonard Wood, Missouri). There were two child study sites (Ft. Knox and Ft. Campbell, Kentucky). Non-calibrated dental officers recorded the dental treatment needs of study participants. Spouses or parents completed a self-administered questionnaire on dental utilization and attitudes toward a hypothetical dental insurance plan.

Major findings of this report are summarized below. Interpretation and discussion of the findings are included in the report itself. Immediately after the four paragraph written summary which follows is another summary which presents the data in outline form.

Dental Treatment Needs

The dental treatment requirements of military family members (FMs) are low. Treatment needs were lowest among 4-14 year olds. Almost three-quarters of this group were in dental fitness class 1 (dfc 1) as compared to 38% of 15-24 year olds and 16% of 25-44 year olds. On average, 0.2 restorations were required by 4-14 year olds, 2.2 by 15-24 year olds, and 2.4 by 25-44 year olds. Most restorative needs were single rather than multi-surface. The greatest treatment need was prophylaxis: 14% of 4-14 year olds, 65% of 15-24 year olds, and 67% of 25-44 year olds required it. When viewed by rank of sponsor, treatment needs concentrated heavily within E1-E3 FMs. On average, 4.0 restorations were required by E1-E3 FMs as compared to 1.7 or less for FMs of other ranks. Moreover, only 12% of E1-E3 FMs were in dfc 1 (compared to 38-67% of other ranks) and over a quarter of them required emergency care (compared to 0.9-12% of other ranks).

Estimated Treatment Costs

Applying the 1985 American Dental Association fee schedule to the survey data, the estimated costs of diagnostic and preventive services were found to range from $27 to $80 per child to $33 to $88 per youth or adult (10th and 95th fee percentiles, respectively). Simple restorative and surgical care added $6 to $13 per child, $8 to $18 per youth, and $75 to $184 per adult. Comprehensive coverage added $107 to $410 per child, $94 to $172 per youth, and $562 to $1,164 per adult. The major contributor to increased average treatment costs for comprehensive care was orthodontics for children and fixed prosthetics for youths and adults.

Reaction to the Hypothetical Dental Insurance Plan

While a majority of FMs at child study sites (72.2%) opposed DoD-sponsored dental insurance, a majority of FMs at adult study sites (57.2%) favored it. Furthermore, at child study sites, a majority of FMs of all ranks as well as 1-2 children families opposed the DoD proposal; at the adult sites, these groups favored the plan. Regardless of site category, families with 3 or more children were opposed to the DoD proposal. Childless couples (56%) and FMs with surgical, restorative, or emergency treatment needs (51-57%) were favorably inclined toward dental insurance, as compared to only a third of FMs with no dental disease. FMs at posts providing at or above 30.7% FM dental services (HSC average) were less supportive of DoD-sponsored dental insurance (55%) than those at posts providing less (73%).

Dental Utilization

Children from families of all ranks, childless couples, and spouses of E1-E3 FMs were the most likely to have had a dental examination within the past year. The highest annual utilization rate was found among children. Compared to current national data on dental services utilization (NCHS, 1982), the annual utilization rate of 4-14 year old military FMs (82.9%) well exceeds the national average for this age cohort (64.2%). The utilization rate for FM 15-24 year olds (59.4%) is comparable to the national rate for this age group (56.6%). However, the dental utilization rate for 45-64 year old military spouses (23.3%) is half of the national average for 45-64 year olds (48.9%).

Outline of Major Findings from the Family Member Dental Treatment Needs Pilot Survey

TREATMENT NEEDS

1. Restorative and surgical treatment needs are low. Restorative needs are mostly single rather than multi-surface restorations. Required extractions involve mostly third molars.

--Viewed by Age:

--3 or less extractions or restorations required by:
98% of 4-14 year olds
70% of 15-24 and 25-24 year olds

--mean number of restorations required:
0.2 by 4-14 year olds
2.2 by 15-24 year olds
2.4 by 25-44 year olds

--mean number of extractions required: highest among 15-24 year olds (0.45)

--Viewed by Rank:

--needs concentrate mostly within E1-E3 family members (FMs)

--3 or less extractions or restorations required by:
49% of E1-E3 FMs
75%+ of E4-E6 and O1-O3 FMs
90%+ of E7-E9, W1-W4, and O4+ FMs

--mean number of restorations required:
4.0 by E1-E3 FMs
1.7 by E4-E6 FMs
1.0 by E7-E9 FMs
0.7 by W1-W4 FMs
1.6 by O1-O3 FMs
0.5 by O4+ FMs

--mean number of extractions required: highest within E1-E3 FMs (0.82)

2. Other treatment needs, with the exception of prophylaxis and oral hygiene instruction (OHI), are low.

--Viewed by Age:

--lowest prophylaxis and OHI needs are with 4-14 year olds

--prophylaxis required by:
14% of 4-14 year olds
65% of 15-24 year olds
87% of 25-44 year olds

--OHI required by:
8% of 4-14 year olds
55% of 15-24 year olds
79% of 25-44 year olds

--periodontal treatment required by:
13% of 15-24 year olds
33% of 25-44 year olds

--For Adults:

--7% have one or more impacted teeth
--4% have pericoronitis
--10% need a removable prosthesis

--For Children:

--13% need definitive orthodontic care
--16% require space maintenance

3. Dental Fitness Classification reveals that 4-14 year olds have the best overall oral health status, while E1-E3 FMs have the worst.

--Viewed by Age:

--Class 1 rate:
73% for 4-14 year olds
38% for 15-24 year olds
16% for 25-44 year olds

--Class 3 rate:
0.6% for 4-14 year olds
14% for 15-24 year olds
15% for 25-44 year olds

--Viewed by Rank:

--Class 1 rate:
12% for E1-E3 FMs
38% for E4-E6 FMs
55% for E7-E9 FMs
61% for W1-W4 FMs
41% for O1-O3 FMs
67% for O4+ FMs

--Class 3 rate:
27% for E1-E3 FMs
12% for E4-E6 FMs
5.2% or less for all other ranks

ATTITUDES TOWARD DOD SPONSORED DENTAL INSURANCE

--Viewed by Treatment Needs:

--FMs with no dental disease are less inclined to support DoD-sponsored dental insurance (33%) than those in need of care (51%+)

--FMs requiring emergency care are the most supportive (59%), while FMs in Class 1 are the least supportive (32%)

--Viewed by Rank and Study Site:

--At adult study sites, 51-69% of FMs of all rank groups favor DoD-sponsored dental insurance

--At child and youth study sites, 25-37% of FMs of all rank groups favor DoD-sponsored dental insurance

--Viewed by Family Size and Study Site:

--At child and youth study sites, 33% of 1-2 child families and 23% of larger families favor DoD-sponsored dental insurance

--At adult study sites, 56% of childless families, 61% of 1-2 child families, and 48% of larger families favor DoD-sponsored dental insurance

--Viewed by Level of Care Provided Relative to HSC Average:

--55% of FMs assigned to posts providing at or above the HSC average for FM dental services favor DoD-sponsored dental insurance

--73% of FMs assigned to posts providing below the HSC average for FM dental services favor DoD-sponsored dental insurance

UTILIZATION CHARACTERISTICS

1. The proportion of FMs having a dental examination within the past year varies by age, rank, study site, and family size.

--Proportion having a dental exam within the past year:

--Viewed by Age:
83% of 4-14 year olds
59% of 15-24 year olds
23% of 25-44 year olds

--Viewed by Rank and Study Site:
For all pay grade groups, utilization is substantially higher at the child study sites (70-87%) than at the adult study sites (17-46%)

--Viewed by Family Size and Study Site:
At adult study sites, annual utilization rates drop as family size increases (25% for 1-2 children; 20% for 3+ children). Childless couples have the highest annual utilization rate (41%)

--At child study sites, annual utilization rates are 80%+ regardless of family size

COSTS

1. The average costs of meeting routine diagnostic and preventive and unmet dental treatment needs were estimated by applying the 1985 American Dental Association Schedule of Fees and Services to the survey data.

--Estimated Average Costs (10th and 95th fee percentiles) by Category of Care and by Age Group:

--For Children (age 4-14):

Diagnostic & Preventive	$27-$80
Restorations, stainless steel crowns, and extractions (Basic)	$6-$13
Basic + space maintenance	$16-$47
Basic + space maintenance & orthodontics	$1[illegible]-$410

--For Youths (age 15-19):

Diagnostic & Preventive	$33-$88
Basic	$8-$18
Basic + Prosthetic & Periodontal	$94-$172

--For Adults (spouses of any age):

Diagnostic & Preventive	$33-$88
Basic	$75-$184
Basic + Prosthetic & Periodontal	$562-$1,164

2. For youths and adults, the pronounced rise in average costs going from basic to comprehensive care is almost entirely accounted for by fixed prosthetics.

CHAPTER 1: INTRODUCTION AND OVERVIEW

1.1 Purpose

The purpose of this pilot study was (a) to assess the oral health of family members of active duty Army personnel, (b) to estimate the dental treatment needs of family members, (c) to estimate the cost of meeting those needs by civilian dentists, (d) to determine the attitude of family members toward the proposed Department of Defense dependent dental insurance plan, and (e) to determine characteristics of the utilization of dental services by military family members.

This information will be useful to the Assistant Surgeon General for Dental Services and the Office of Health Affairs, Department of Defense in designing the benefits package for and estimating the cost of family member dental insurance.

1.2 Background

Military family members receive a wide range of routine dental care at some Army posts and only limited care at others. At some DENTACs, for example, family members receive more than 40% of the treatment provided while at others only examinations and emergency treatment are provided. The effect of variation in access to military dental care on the treatment needs of family members is unknown.

Differences in the oral health status and dental treatment needs have been documented between grade school children from Army posts offering a wide range of dental services and those from installations where only preventive and emergency care was afforded (1,2). Although the prevalence of dental caries was similar for both groups, the percentage of decayed, missing, and filled surface (DMFS) scores attributable to decayed surfaces was significantly lower in children with access to routine military dental care. Likewise, the percentage of total DMFS scores attributable to filled surfaces was significantly higher among children receiving routine family member dental care. This was so despite the fact that families who did not have access to military care facilities spent, on average, nearly twice as much per year on civilian dental care than their counterparts who did have access to military dental care; $193.50 versus $109.45, 1977 dollars (3).

A similar comparison for adult military family members has never been made. However, two studies have examined the oral health status and dental treatment needs of adults on Army posts where family member dental care was available (1,4,5). These studies found that the mean cost of satisfying all unmet dental treatment needs was highest for wives ($330.47, 1977 dollars) and lowest for children age 4-7 ($82.27, 1977 dollars). Furthermore, the financial burden of paying for these unmet needs would have

been greater for enlisted personnel and warrant officers (between 6.7 and 8.7% of base pay) than for commissioned officers (between 2.9 and 4.5% of base pay, respectively).

Even with adjustment for inflation, these estimates may be overstated for today's military family. A general decline in the caries rate has been noted in the U.S. population in recent years (6). In addition, the rapid growth of dental insurance coverage in the past decade has allowed a greater number of people access to dental care (7). Some military families may have benefited from dental insurance held by working spouses of active duty personnel.

A 1984 attitude survey conducted on a post where routine family member dental care was unavailable found that 73.2% of respondents cited cost as the greatest barrier to dental treatment. Moreover, in response to the question: "If a military dental insurance plan were available would you be willing to contribute $10 per month per dependent?", 52.2% replied affirmatively (8). However, a poll on a post which offers family member dental care has never been reported. It is quite likely that respondents with access to free dental care would be less enthusiastic about dental insurance.

1.3 Objectives of the Pilot Study

The objectives of this pilot study were.

a. To conduct a clinical dental survey to determine routine restorative, prosthetic, periodontal, prophylactic, and oral surgical treatment needs for youths and spouses of military families.

b. To conduct a clinical dental survey to determine routine restorative, orthodontic, prophylactic, and oral surgical treatment needs for children of military families.

c. To conduct a survey to determine the attitude of military families toward a hypothetical co-pay family member dental insurance plan.

d. To conduct a survey to determine some dental utilization characteristics of military family members.

e. To determine the cost of meeting the dental treatment needs of military family members by civilian dentists. Costs will be compared for coverage of basic needs, such as exams, prophylaxis, and simple restorative care, as well as comprehensive needs.

CHAPTER 2: METHODS

2.1 Overview

Data were collected by routine dental examinations and by questionnaires administered to adult military family members. The data collection forms, the instructions to examiners, the child and youth consent form and questionnaire, and the adult questionnaire are presented in Appendix A. Table of results are presented in Appendix B.

For the purpose of this study, children are defined as individuals up to age 14. Individuals age 14-21 still living with their parents are defined as youths. The spouse of an active duty military member, regardless of age, is defined as an adult.

2.2 Sampling

Seven study sites were selected: two for collecting data on children and youths and five for collecting data on adults. Fort Knox and Fort Campbell, Kentucky were chosen to survey children and youths. Fort Sill, Oklahoma, Fort Riley, Kansas, Fort Leonard Wood, Missouri, Fort Polk, Louisiana, an Fort Carson, Colorado, were chosen for the adult survey.

Children and youths who had parental consent to participate in the study comprised one sampling frame. From this frame, five to ten students per classroom were randomly selected for inclusion in the survey. For adults, the sampling frame included all spouses of active duty Army personnel who, on their own volition, reported for dental examinations at dental clinics chosen for the study. Adults who were undergoing routine treatment or who were seeking emergency care were excluded from the survey in order to avoid bias toward underestimating or overestimating treatment needs. Entire enrollments at study site schools received parental consent forms. Over 95% of the child consent forms were returned granting consent, but the return rate for youths was only 40%.

2.3 Procedure

The data were collected over a nine week period (2 September to 31 October). Because of the time constraints of the study, examining officers were not calibrated. The number of decayed, missing, and filled permanent teeth (DMFT) and/or the number of decayed, missing, and filled deciduous teeth (dmft), as appropriate, was charted. Also, for adults, presence of the following clinical conditions was visually assessed: impacted third molars, pericoronitis, and number of papillae affected with acute necrotizing ulcerative gingivitis (ANUG). Radiographs were not taken.

Examiners completed treatment plans for patients using the guideline: "If you were a dentist in private practice, how would you treatment plan this patient knowing the patient has dental insurance?" Needs for restorations, extractions, prophylaxis, and oral hygiene instruction were assessed on all patients. The need for definitive orthodontic care was assessed in children, and the need for periodontal care was assessed in youths and adults.

In addition, examiners evaluated each patient's potential for having a dental emergency within a year's time on an overall and a by tooth basis. A patient was categorized as Class 1 if no dental treatment or only a prophylaxis was required, Class 2 if in need of dental care but unlikely to develop a dental emergency within 12 months, and Class 3 if likely to develop a dental emergency within 12 months.

With the exception of space maintenance, all treatment needs were based on the clinical judgment of the examiners. The need for space maintenance was determined by a computer algorithm which compared missing teeth to an age and sex adjusted tooth eruption chart (9).

Sociodemographic data (age, sex, ethnic group, and rank of sponsor) were collected on each patient. Education level was collected from adults only. Also, answers were solicited to a questionnaire concerning utilization of dental services and attitudes toward dental insurance. Most of these data were recorded by the examiner in response to direct questioning or observation. However, for children and youths, age, rank of sponsor, and replies to the questionnaire were transcribed by the examiner from the parental consent slip to the survey form. The content of the child and youth and the adult questionnaires differed somewhat (see Appendix A).

2.4 Data Management

Completed survey forms were screened and edited at the U.S. Army Health Care Studies and Clinical Investigations Activity (HCSCIA) and were entered onto a computer tape through a contract monitored by the Health Care Systems Support Activity. Data analysis was performed by Dental Studies personnel at the Ft. Detrick Data Processing Center using the Statistical Analysis System (SAS).

CHAPTER 3: RESULTS

Results from the pilot study are presented in four sections corresponding with previously stated study objectives. These sections are treatment needs, attitudes, utilization characteristics, and cost.

3.1 Sample Characteristics

Two main samples were drawn upon in calculating the results. Attitudes and utilization characteristics were determined using data from both examined and non-examined study participants (N=2,562); treatment needs and cost were derived using data from survey participants who had received clinical examinations (n=1,647). The actual sample size for a given subanalysis may be less than either of the two main sample sizes due to missing values. For instance, statistics pertaining to orthodontic treatment needs draw on a much smaller sample, as data on this variable were collected only for children under age 14. Sample sizes for each subanalysis are stated on their respective tables.

Of 1,732 children and youths with parental consent, 644 children and 173 youths were selected for examination. Adult exams numbered 830. Attitudinal and utilization responses were collected from child and youth consent forms as well as adult examination forms (N=2,562).

Table 1-1 presents selected sociodemographic characteristics of the sample. The sample is predominantly young (less than 25 years old), female, white, from middle-grade enlisted (E4-E6) families, and of moderate to high (12 to <16 years) education level.

3.2 Dental Treatment Needs

Treatment needs were analyzed both collectively and for specific age or rank groups. Tables 2-1 and 2-2 show results for the overall sample. Table 2-1 shows the frequency distribution for the number of restorations and extractions required by military family members. Over half of the sample required no restorations or extractions and 82.1% required less than 4.

The average cost for basic care for adults is considerably higher than that for children or youths. This is due not only to a higher prevalence of caries but also to requirements for more multi-surface restorations and simple third molar extractions. Comprehensive care increases adult average treatment cost dramatically, primarily due to fixed prosthetic requirements.

Table 2-2 shows the overall distribution for the patient fitness classification. Over 90% of the sample split evenly between Class 1 and Class 2, leaving just under 10% requiring emergency care (Class 3).

These overall figures should be interpreted with caution, however, because they are not weighted to reflect the age or rank distribution of the sampled population. Age and rank, which is a composite of education, income, and social class, are known to influence the distribution of dental disease in the general population.

Three age categories were established for analysis: 4-14, 15-24, and 25-44. These age bands were selected for several reasons. First, they correspond to those used in dental utilization studies by the National Center for Health Statistics. Second, they correspond to the development of the dentition and the natural history of dental disease. The first age band (4-14) captures the mixed dentition, while the second and third age bands capture the permanent dentition. Together, the first and second age bands capture the period of high caries incidence; the third age band captures the period of high periodontal disease incidence. Finally, the sample breaks down conveniently into three nearly equal cell sizes. Individuals 45 and older were excluded, as they constituted too small a cell size (n= 18) to be analyzed statistically.

Table 2-3 shows the frequency distribution for the number of restorations and extractions required by military family members by age group. Restorative and surgical treatment needs are directly related to age. The most striking finding was that the youngest age group had virtually no unmet treatment needs. Among 4-14 year olds, 86.1% required no extractions or restorations. An additional 12.6% required only one to three teeth extracted or restored. Nearly three-quarters of the remaining two age groups required fewer than four teeth extracted or restored. Thus, per capita restorative and surgical treatment needs overall were quite low. While most 15-24 year olds required no restorative or oral surgical care, most 25-44 year olds required 1-3 extractions or restorations.

The mean number of types of restorations and extractions by age group is shown in Table 2-4. The mean number of restorations required by 4-14 year olds was one-tenth that of 15-24 year olds or 25-44 year olds. The ratio of multi-surface to single surface restorations was approximately three-to-one for 4-14 year olds, two-to-one for 15-24 year olds, and one-to-one for 25-44 year olds.

The mean number of extractions required was highest among 15-24 year olds, the majority of which were third molars. Even among 25-44 year olds, the mean number of third molars treatment planned for removal accounted for the majority of all teeth indicated for extraction. The lowest average number of extractions was among 4-14 year olds. Third molars accounted for only one-third of these extractions.

Oral hygiene instruction and prophylaxis needs are presented in Table 2-5. The need for both services bears a strong direct relationship to age. While barely over 10% of 4-14 year olds

required prophylaxis, nearly two-thirds of 15-24 year olds and nearly 90% of 25-44 year olds did so. Similarly, less than 10% of 4-14 year olds required oral hygiene instruction compared to more than half of 15-24 year olds and over three-quarters of 25-44 year olds.

The remaining dental treatment needs were assessed on subsets of the sample. The need for periodontal surgery or for scaling and root planing was assessed only for youths and adults. Table 2-6 shows the need for periodontal care by age group.

The need for periodontal care varies directly with age. While surgical treatment needs were very low (0.9% for 15-24 year olds and 4.5% for 25-44 year olds), up to a third of 25-44 year olds required scaling and root planing.

The presence of visibly erupted, impacted third molars and of pericoronitis was assessed only for youths and adults. Table 2-7 shows that a very low proportion of the sample had impacted teeth or pericoronitis. Of those with impactions, most had only one or two impacted teeth.

Only adults were assessed for removable prosthetic requirements. Table 2-8 reveals that such needs were low. Only 9.5% of adults were in need of a removable prosthetic appliance. Needs concentrated mostly in mandibular and maxillary partials (7.8% and 5.2% of adults, respectively). Requirements for complete dentures were very low (1.4% for maxillary and 0.1% for mandibular dentures).

The need for definitive orthodontic care and for space maintenance was determined only for children. Table 2-9 shows that within this group, 13.4% were found in need of orthodontic care and 15.6% were found in need of space maintenance. There was little overlap between the two categories of care, only 2.5% of children required both services.

Table 2-10 presents the overall patient fitness classification by age group when treatment needs are viewed in aggregate. There is a striking drop in the Class 1 rate and a rise in the Class 2 rate from the youngest to the oldest age groups. While nearly three-quarters of 4-14 year olds were in Class 1, barely over a third of 15-24 year olds and only 16.4% of 25-44 year olds were in Class 1. Similarly, the Class 2 rate went from roughly a quarter of 4-14 year olds, to nearly half of 15-24 year olds, to over two-thirds of 25-44 year olds. The need for emergency care, as reflected by the Class 3 rate, was near-zero for 4-14 year olds (0.6%), 13.9% for 15-24 year olds, and 15.3% for 25-44 year olds.

Aside from age, another well-known factor that influences oral health status is socioeconomic status (SES). Socioeconomic status is a complex measure of income, social status, and education. Although SES was not measured in this study, rank serves as a reasonably good proxy for SES. Table 2-11 shows the distri-

bution of extraction or restoration requirements by rank for military family members.

Over two-thirds of the family members of E7-E9s, nearly three-quarters of those of W1-W4s over 80% of those of O4s and above required no extractions or restorations. However, the absence of restorative and surgical treatment needs drops dramatically for family members of lower ranking soldiers. While nearly half of the family members of E4-E6s and O1-O3s needed no extractions or restorations, only 17.6% of family members of E1-E3s had no restorative or surgical treatment needs. In fact, for every category of restorative and surgical treatment needs, family members of E1-E3s demonstrated the greatest needs.

Roughly half the family members of E1-E3s required three or fewer teeth extracted or restored while 13.5% required ten or more. By comparison, over three-quarters of E4-E6 and O1-O3 family members, and over 90% of those of the remaining ranks required three or fewer teeth extracted or restored. Less than 1% of E7-E9, W1-W4, and O1 and above family members had treatment needs of 10 or more restorations or extractions. Only 5.4% of E4-E6 family members had such extensive treatment needs.

Table 2-12 presents the mean number of restorations and extractions by rank of sponsor. Family members of E1-E3s, on average, needed four restorations, roughly 2.5 to 8 times as many as those of other pay grade groups. In every pay grade group except that of O4s and above, the majority of restorative needs were single surface restorations.

With regard to extractions, again family members of E1-E3s demonstrated greater needs than those of all other groups. On average, they required .82 extractions, more than two to 47 times that required by any other group. For every group except W1-W4s, the majority of teeth requiring extraction were third molars.

Table 2-13 shows dental fitness class by pay grade of sponsor. Relatively few E1-E3 family members required no treatment (Class 1). This compares with more than a third of those of E4-E6 and O1-O3, and over half of the those of all other grades. Emergency needs, as reflected by the Class 3 rate, were concentrated in family members of E1-E3s. Over a quarter of this group were identified as being in Class 3. Of the families members of E4-E6s, 12% were in Class 3, while all other groups experienced rates below 6%.

3.3 Attitudes Toward the Hypothetical Dental Insurance Plan

Attitudes toward a hypothetical co-pay insurance program based on the best estimate of a pending DoD-sponsored family member dental insurance plan were collected from both examined and non-examined study participants. This plan will be referred to as the "DoD dental insurance plan" throughout this report. Overall, 37.6% of all respondents answered affirmatively to the question: "Would you join an insurance plan costing $10 a month

per family member which would pay for 80% of the cost of cleaning and restorative care such as caps and fillings?" Of the 5.4% already covered by dental insurance, 32.1% were in favor of the DoD proposal. This compares with 37.9% of those who were not already covered.

The influence of other factors on attitudes toward the DoD plan was also explored. Specifically, the impact of rank of sponsor, family size, treatment needs, and overall dental fitness classification was investigated. Table 3-1 shows a breakdown of attitudes toward the DoD plan by pay grade of sponsor.

The plan was viewed most favorably by junior enlisted soldiers' family members and least favorably by those of senior NCOs and commissioned officers. Junior enlisted soldiers' family members were the only group showing a majority in favor of the plan.

To examine the relationship between family size and attitudes toward the DoD dental insurance plan, families were categorized according to number of children. Table 3-2 shows that as family size increases, support for dental insurance decreases. While the majority of families without children were in favor of DoD-sponsored dental insurance, slightly less than half of families with 1-2 children supported it and only 26.6% of families with 3 or more children did so.

The relationship between attitudes toward dental insurance and treatment needs was examined. Tables 3-3 and 3-4 demonstrate that family members with no dental disease were less inclined to support DoD-sponsored dental insurance than those in need of care. Individuals requiring emergency care were the most supportive of it. Nonetheless, a sizable number of Class 3 individuals had unfavorable attitudes toward dental insurance.

Tables 3-1 and 3-2 consist of pooled data from examined and non-examined family members. Since two-thirds of these data were collected from the child and youth study sites, the responses were heavily weighted toward these sites and may not be generalizable. Indeed, when the data are viewed by site category, a different picture emerges. While at the child and youth study sites (n= 1631) only 27.8% of family members favored the DoD proposal, at the adult study sites (n= 830) 57.2% did so.

Tables 3-5 and 3-6 show the breakdown of attitudes toward the DoD dental insurance proposal by rank and by study site. It is noteworthy that, at the child and youth study sites, no rank group showed a majority of family members in favor of the DoD proposal. In contrast, at the adult study sites, every rank group had a majority of family members supporting dental insurance.

The influence of family size on attitudes toward dental insurance was also found to vary between the adult and the child and youth study sites. Tables 3-7 and 3-8 reveal that, at the

child and youth study sites, regardless of family size, family members were opposed to dental insurance. However, at the adult study sites, only larger families (3 or more children) did not report a majority in favor of the DoD proposal.

Because the proportion of treatment provided to family members differed among the sites, pooling of data may mask differences between distinct subsets within the sample. In the fourth quarter of FY 86 the proportion of treatment provided to family members ranged from 21% at Fort Carson to 47.4% at Fort Sill. The HSC command-wide average was 30.7%. Fort Carson was the only DENTAC in the study providing a lower proportion of care to family members than the HSC average. Analysis of attitudes toward DoD-dental insurance shows a marked difference between Fort Carson and the other sites. Seventy-three percent of the family members examined at Fort Carson (n= 99) favored DoD dental insurance versus 55% of family members examined on other posts (n= 722). The small sample size of the low-proportion group precluded further analysis.

3.4 Dental Utilization

Respondents were asked to identify the time interval since their last military or civilian dental examination. The time interval since last dental examination by age group is presented in Table 4-1. Eighty-three percent of 4-14 year olds had seen a dentist within the past year. Fifteen to twenty-four year olds also showed a high utilization rate (59.4%). Only 23.3% of 25-44 year olds, however, had been examined within the past year. Equally noteworthy is the sharp contrast among those not having a dental check-up for 10 or more years. Virtually no 4-14 year olds or 15-24 year olds fell into this category, yet 20.2% of 25-44 year olds did.

When the time interval since last examination is examined by rank (Table 4-2), it is apparent that the family members of more senior military personnel have higher utilization rates. Approximately 70% of family members of sponsors above the grade of E3 had a dental visit within the past year as compared to 46% of those of E1s-E3s.

Utilization of dental services varied with family size. The larger the family, the higher the annual utilization rate. Roughly 40% of families with no children had seen a dentist within the past year as compared to 61.3% of 1 to 2 child families, and 74% of families with 3 or more children.

As with the attitude data, the utilization data consist of a disproportionate mix of responses by study site. Thus, when the time interval since last examination is examined by rank and by study site, the utilization pattern that emerges is quite different from that presented by the combined data.

Tables 4-3 and 4-4 show the time interval since last dental examination by rank of sponsor and category of study site. For

all pay grade groups, utilization is substantially higher at the child study sites than at the adult study sites. Utilization among adults decreases as one rises through the enlisted ranks yet increases as one rises through the officer ranks. Adult junior enlisted soldiers' family members are the most likely to have had a dental examination within the past year.

The influence of family size on utilization was different in the adult sites versus the other sites. At adult study sites, annual utilization rates dropped as family size increased (25.1% for 1-2 children families versus 20% for 3 or more children families). Childless couples had the highest annual utilization rate (41%). However, at child study sites, the opposite trend was observed. Larger families had slightly higher utilization rates than smaller ones (80.4% for 1-2 children families versus 83% for 3 or more children families). Regardless of family size, annual dental utilization rates at child study sites were double those at adult study sites.

3.5 Estimated Costs for Dental Care

The average costs of meeting routine diagnostic and preventive and unmet dental treatment requirements for military family members were calculated. For these calculations, it was assumed that all family members would receive an oral examination, a prophylaxis, and bite-wing radiographs. Costs were estimated by applying the 1985 American Dental Association (ADA) Schedule of Fees and Services (10) to these routine needs as well as to the unmet treatment needs identified in the survey. Average costs were determined for the 10th, 25th, 50th, 75th, 90th, and 95th percentiles of the fee scale.

Owing to a different mix and price of services, treatment costs for children were computed separately from those of youths and adults. For children, average costs for four categories of care were calculated: 1) diagnostic and preventive, 2) basic, 3) basic plus space maintenance, and 4) comprehensive. Diagnostic and preventive services include routine examinations, bite-wing radiographs, and oral prophylaxis. Basic care refers to restorations, stainless steel crowns, and extractions. Comprehensive services consist of basic care, space maintenance, and orthodontics.

For youths and adults, average costs were calculated for three categories of care: diagnostic and preventive, basic, and comprehensive. The first two categories are the same as for children. However, the comprehensive category for youths and adults excludes orthodontics but adds prosthetics and periodontal therapy to basic care costs. Diagnostic and preventive costs are not included in the comprehensive total. The average cost of preventive and diagnostic care is fixed in the sense that these services are assumed to be required by all family members. In contrast, the average costs of other categories of care varies with the prevalence of dental disease within the sample.

Table 5-1 shows the average treatment costs per child by category of care at various fee percentiles. The average cost of basic care is low, reflecting the low prevalence of dental caries found among children in the survey. When space maintenance is added to basic care, the average cost of treatment climbs three to four fold. Although the prevalence of space maintenance needs is low (15.6%), the cost per case for this service is high. The high average cost of comprehensive care is attributable to a small number of orthodontic cases that are expensive.

Table 5-2 presents the average treatment costs by category of care at various fee percentiles for youths. The average cost for basic care for youths is low due to the low prevalence of dental caries. Comprehensive care drives the average cost up 10 to 12 fold. The pronounced rise in average costs going from basic to comprehensive care is almost entirely accounted for by fixed prosthetic requirements.

Adult average treatment costs by category of care at various fee percentiles is presented in Table 5-3. The average cost for basic care for adults is considerably higher than that for children or youths. This is due not only to a higher prevalence of caries but also to requirements for more multi-surface restorations and simple third molar extractions. Comprehensive care increases adult average treatment cost dramatically, primarily due to fixed prosthetic requirements.

CHAPTER 4: DISCUSSION

4.1 Limitations of the Study

In reviewing the results of this study, several limitations should be kept in mind. The most important concerns the representativeness of the sample to Army family member population. Because two-thirds of the attitude and utilization data came from families with children, it is unlikely that the sample is representative of Army family members. No sociodemographic profile of Army family members could be identified to which the sample profile could be compared. In addition, two issues are of concern: selection of survey participants and selection of study sites.

Adults examined for this study were not randomly selected. By limiting the sample to adults who were seeking routine dental examinations, a selection bias may have been introduced. Since adults voluntarily seeking dental examinations may place a higher value on their oral health than the population in general, their dental treatment needs may be lower. In addition, by excluding family members seeking emergency care, a group with potentially high treatment needs may have been missed. To the extent that the dental treatment needs of non-selected adults differ from those who were examined, adult dental treatment needs may be understated.

Although children and youths were randomly selected, the youth sample may be unrepresentative because only 40% of the consent forms were returned. To the extent that the treatment needs of youths who were examined differed from those who were not examined, a bias of unknown magnitude and direction may have been introduced. In contrast, since over 95% of child consent forms were returned and granted consent, the sample of children may be more representative.

Due to time constraints, sites were selected that would facilitate efficient data collection. Military installations with large family member populations and DoD school systems were chosen. This may have introduced a site bias.

The level of services provided to family members may have introduced another site bias. Respondents at a site providing a low proportion of family member care were more favorable towards DoD dental insurance compared with those at other sites. Unfortunately, the effect of this bias on pooled results could not be explored due to the small sample size at the low proportion site. While differing proportions of treatment provided to family members, appeared to effect attitudes, this relationship may be further confounded by the size of the family member catchment. In other words, the proportion of the catchment's needs that are being met would be a better covariate in analyzing attitudes.

The two sites chosen for collecting children's data had large enrollments at on-post schools and had aggressive, well-established, preventive dentistry programs. The extremely low disease level coupled with a high utilization rate at the child and youth study sites raises yet another possible limitation of the study. That is, do these results represent a cohort effect, a preventive effect, or a treatment effect? In other words, would children and youths at other Army installations have as low disease levels (cohort effect) or do children and youths at Fort Knox and Fort Campbell have such low disease levels because they are so well-served by their DENTACs (treatment effect) or because of the aggressive preventive dentistry programs in on-post schools (preventive effect). If a cohort effect is present, then the sample of children and youths drawn for this study is representative of the population of children and youths Armywide. However, if a treatment or preventive effect exists, then the sample may be atypical. At other Army installations the dental treatment needs of children may be greater.

Site selection also influenced attitude and utilization results. Because two-thirds of the attitude and utilization data were collected from the two children's study sites, responses are heavily weighted toward those sites. Thus, attitudes and utilization characteristics might be site-specific and not generalizable.

Sampling considerations aside, other limitations contributed to understating treatment needs. Since no radiographs were taken, oral surgical and restorative treatment needs were underassessed. In addition, the need for endodontic therapy was not assessed nor was the intensity of periodontal care or the need for sealants. Thus, at best, the study provides a conservative estimate of treatment needs.

Because the treatment needs estimate is based on prevalence data, it can only be used to cost out treatment of unmet dental needs in a well-defined population at a given point in time. In other words, it is a static estimate. Not captured are population and dental disease dynamics, such as an influx of new patients with unmet needs, progression of dental disease, or recurrence of dental disease. Hence, the data cannot be used to project annual program costs.

Another limitation of the pilot study was that the examiners were not calibrated. Time constraints forced the survey to be fielded without calibration training, hence interexaminer and intraexaminer reliability were not tested. Attempts were made to minimize errors in data collection by close monitoring of survey forms as they were turned in weekly. Examiners who made questionable entries were contacted by phone and misconceptions were cleared as quickly as possible.

Finally, prior to the study, it was suspected that several collectible data elements, e.g., rank, age, and family size, might impact on treatment needs. Yet owing to the limited data

collection period, a large enough sample was not obtained to allow for other than univariate analysis. In addition, other factors may be highly related to treatment needs, utilization characteristics, and attitudes toward the DoD insurance program. For example, the number of months the respondent has been at the study site is extremely important. For newly arrived family members, the previous post their sponsor was assigned to probably had a greater effect on their dental needs and attitudes toward the DoD plan than their current location.

4.2 Dental Treatment Needs

Tables 2-1 through 2-13 show that the dental treatment needs of military family members are low. Overall, the greatest treatment needs were found among 25-44 year olds and the least among 4-14 year olds. Almost three-quarters of 4-14 year olds were in dental fitness Class 1.

The most prevalent treatment need for all age groups, except 4-14 year olds, was prophylaxis. Next, in order of greatest need, came oral hygiene instruction followed by restorations or extractions. Over half of 15-24 year olds and over 70% of 25-44 year olds required the aforementioned services. A third or less of both groups required periodontal surgery, periodontal scaling, or removable prosthetics.

Among 4-14 year olds the greatest need was for space maintenance, followed, in decreasing order, by restorations and extractions, prophylaxis, orthodontics, and oral hygiene instruction. Yet each of these services was required by only 16% or less of 4-14 year olds. The finding that 4-14 year olds had such low dental treatment needs is consistent with recent trends indicating low dental disease in this cohort in national caries prevalence surveys.

Treatment needs were highest among the family members of E1-E3s. Fifty percent or more of the family members of sponsors in grades E4 and above had no restorative or surgical needs, while over 80% of those of E1s-E3s needed such care. The mean number of restorations was 2.3 to 8.5 times higher in family members of E1s-E3s than in those of all other groups. Over a quarter of junior family members of E1-E3s required emergency treatment. This may represent the accumulated dental needs of the spouses of junior enlisted soldiers prior to becoming military family members.

The finding that family members of E1-E3s have greater needs than those of other groups suggests several possibilities. One is that, over time, soldiers whose families are in poor oral health tend to exit from the Army leaving those with better oral health remaining on active duty. Alternatively, families of E1-E3s may face access barriers to obtaining military or civilian dental care, such as lack of transportation. Also, it is possible that the Army Dental Care System meets the needs by treating family members over the course of their sponsors' careers. It

may simply take a number of years for the System to exert its influence.

4.3 Attitudes Toward the Hypothetical Dental Insurance Plan

Sixty-two percent of all family members were opposed to the DoD family member dental insurance proposal. However, since two-thirds of attitudinal data were collected from the child and youth study sites, this figure was heavily weighted toward those sites. While a majority of family members at the child and youth study sites (72.2%) were opposed to the DoD proposal, a majority of family members at the adult study sites (57.2%) were in favor of it. Furthermore, at the child study sites, a majority of family members from all ranks as well as from 1-2 children families opposed the DoD proposal; at the adult sites, these groups favored the plan. Childless couples and family members with surgical, restorative, or emergency treatment needs were favorably inclined toward dental insurance. Regardless of the site, families with 3 or more children were opposed to the DoD proposal. When adult study sites were stratified by proportion of care provided to family members, another site-specific effect emerged. Family members at Fort Carson, which had the lowest proportion of family member treatment of the sites sampled, were more supportive of dental insurance (72.7% in favor) than those at the other sites (55.1% in favor). Thus, in general, favorable attitudes toward the plan varied with site category and with treatment need.

A majority of family members of E1-E3s, a group that has the greatest treatment needs and a high annual utilization rate, were in favor of dental insurance. A possible explanation is that the respondents feel the Army dental care system is not providing sufficient access to care. Family members may feel that space available dental care is either not available or takes too long to obtain. Given the trade off between queues for free care or some cost for more immediate service, it appears that many military family members, especially those assigned to the post with a proportion of family member treatment below the HSC average,would choose to pay some cost (through dental insurance) to receive prompt care. Likewise, childless couples and those in need of dental care would do the same. On the other hand, military families at posts with effective pediatric dentistry programs as well as larger families appear to value access to free dental care.

Since the DoD had not announced details of its dental insurance proposal prior to this study, a hypothetical plan, based on news reports, was constructed by the investigators (Appendix A). Therefore, these results must be interpreted cautiously since they pertain only to the hypothetical plan presented to the respondents. Other plans with differing levels of copayment or deductibles might be received differently.

4.4 Dental Utilization

Utilization of dental services by military family members varied by age, rank of sponsor, and family size. Children, especially those 4-14 years old, childless couples, and spouses of junior enlisted soldiers were most likely to have had an annual dental examination. A possible explanation for this is that 48% of the family members were children and youths who were exposed to an effective military preventive dentistry program. Such programs often provide annual screening examinations. Since the questionnaire did not distinguish screening examinations from periodic examinations or substantive treatment these figures may overstate the utilization of dental services.

Compared to recent national data on dental services utilization (11), the annual utilization rate of 4-14 year old military family members (82.9%) well exceeds the national average for this age cohort (64.2%). The utilization rate for family member 15-24 year olds (59.4%) is comparable to the national rate for this age group (56.6%). However, the dental utilization rate for 45-64 year old military spouses (25.3%) is barely half of the national average for 45-64 year olds (48.9%).

These comparisons to national data must be interpreted with caution because ambiguity in the instructions to the examiners may have resulted in a miscoding of the response. A code of zero may have been used to indicate either non-response to the question or a short time interval since last dental examination.

4.5 Estimated Costs for Dental Care

The average costs of providing routine diagnostic and preventive care and satisfying treatment needs were computed for different categories of care. The mean cost of diagnostic and preventive services was fixed at $27 to $80 per child and $33 to $88 per youth or adult (10th and 95th percentiles, 1985 ADA fee schedule). The additional costs for simple restorative and surgical care ranged between $5.96 to $12.71 for children, $7.89 to $17.61 for youths, and $74.75 to $183.92 for adults. The differences among these groups reflect a greater prevalence of needs related to caries within the older age groups. Comprehensive care for children averaged $16.15 to $46.66, excluding orthodontics, to $106.77 to $409.68 if orthodontics were included. In contrast, the average comprehensive treatment cost for youths was $94.31 to $171.72. For adults it was $562.23 to $1,163.61. For adults and youths, the major contributor to increased average treatment costs for comprehensive care was fixed prosthetic requirements.

These findings demonstrate that the total cost of meeting the dental treatment needs of military family members via private insurance will depend on the age mix and the prevalence of dental disease in the population as well as the comprehensiveness of services covered.

4.6 Conclusions

a. Viewed by age group, per capita restorative and simple surgical treatment needs of military family members are low. Needs for periodontal therapy, complicated extractions, prosthetics, orthodontics, and emergency dental care are even lower.

b. The need for oral hygiene instruction and prophylaxis is low for 4-14 year old family members but high for 15-24 and 25-44 year old family members.

c. Viewed by rank of sponsor, routine and emergency treatment needs concentrate heavily within the family members of junior enlisted soldiers.

d. Military family members assigned to posts with thorough pediatric dental care as well as larger families oppose the DoD dental insurance proposal. However, many family members, especially those living on posts providing little care, childless couples, and those in need of routine or emergency dental care are in favor of dental insurance.

e. Children, especially 4-14 year olds, spouses of junior ranking enlisted family members, and childless couples tend to utilize dental services more than other groups.

f. Compared to national data, the annual utilization rate for military family members exceeds (4-14 year olds), is comparable to (15-24 year olds), or falls below (25-44 year olds) national rates.

g. Costs for providing preventive, diagnostic, and basic restorative and surgical treatment for military family members by civilian dentists would be inexpensive. However, including comprehensive dental services would be prohibitively expensive.

4.7 Recommendations

a. A full-scale study of military family members should be done within the year. The limitations of the pilot study have been discussed. Many of these could be overcome in a well-designed full-scale study. Key improvements would include: 1) using calibrated examiners to enhance the validity of the study results, 2) enlarging sample size to improve the precision of the estimates, which would allow multivariate analysis, and to allow testing for site-specific trends or bias, 3) selecting study sites to include DENTACs with varying levels of family member care in CONUS, and OCONUS locations to determine whether site-specific differences in access to space available dental care impact on the oral health status of military family members, and 4) collecting more detailed information such as decayed, missing, and filled surfaces (DMFS) instead of DMFT, data on use

and needs for sealants, more detail about periodontal or orthodontic treatment needs, as well as more in-depth questions about attitudes towards dental insurance.

b. A full-scale study of the treatment requirements of military family members should be conducted every four years to allow monitoring of the progress of attempts at improving their oral health status.

c. Since the cost to the government will depend on the structure of the insurance plan (level of copayment, deductibles, *etc.*), the willingness of military family members to pay higher premiums or copayments for the inclusion of more comprehensive coverage or an annual *per capita* expenditure cap should be investigated.

REFERENCES

1. Barnes, G.P. and Parker, W.A. (1977). Dental care requirements of dependents of active duty U.S. Army personnel (Report HCSD-77-001). Fort Sam Houston, TX: U.S. Army Academy of Health Sciences, Health Care Studies Division.

2. Barnes, G.P., Parker, W.A., and Calahan, M.W. (1978). Prevalence of dental caries among dependent children of Army personnel. Virginia Dental Journal 55, 2.

3. Barnes, G.P., Parker, W.A., and Cheatham, J.L. (1978). Expenditures for dental care purchased by dependents of military Military Medicine 143, 703.

4. Barnes, G.P., Parker, W.A., and Cheatham, J.L. (1978). Estimated cost for complete dental care for Army dependents. Military Medicine 143, 707.

5. U.S. Army Medical Research and Development Command. Dental care requirements for dependents of active duty Army personnel (Report No. 32). Washington, DC: U.S. Army Institute of Dental Research, 1974.

6. Bohannan, H.M., Graves, R.C., Disney, J.A., Stamm, J.W., Abernathy, J.B., and Bader, J.D. (1985). Effect of Secular Decline in Caries on the Evaluation of Preventive Dentistry Demonstrations. Journal of Public Health Dentistry; 45: 83-89.

7. Health Insurance Association (1983). Sourcebook of health insurance data: 1982-1983, Washington, D.C.

8. Shulman, J.D., Brusch, W.A., and Sanfilippo, F. (1984). Fort Ord dependent dental survey (HCSCIA Consultation Report 84-003). Fort Sam Houston, TX: U.S. Army Health Care Studies and Clinical Investigation Activity, Dental Studies Division.

9. Moyers, Robert E. (1977). Handbook of orthodontics for the student and general practitioner, 3rd ed. Chicago: Yearbook Medical Publishers.

10. Bureau of Economic and Behavioral Research (1986). Dental fees charged by general practitioners and selected specialists in the United States, 1985. Journal of the American Dental Association, 113, 811.

11. National Center for Health Statistics, Public Health Service, U.S. Department of Health, Education, and Welfare (1982). Dental visits volume and interval since last visit; United States, 1978 and 1979. Vital and health statistics. Series 10, No. 141.

APPENDIX A

Letter of Instruction for the Child Dental Needs Survey

GENERAL INSTRUCTIONS

1. Be sure the patient has a consent form signed by a parent.

2. Transfer the patient's age from the consent form (question 1, side one) onto the survey form.

3. Transfer the data collected in the Family Dental Care Questionnaire on side two of the consent form (questions 1 through 5) onto the survey form.

4. Use a Child Dental Needs Survey form for children less than 14 years of age. For children over 14 years old, use an Adult Dental Needs Survey form and refer to the Adult Dental Needs Survey LOI.

5. No medical history is required for children under 14. Be sure to obtain a health history on children over 14 years old.

6. No radiographs will be used for this exam. Complete this survey without referring to x-rays.

DMFT EXAM COLUMNS

1. The results of the DMFT exam will be recorded in the second and third columns, labeled TOOTH TYPE and DMFT, respectively, on the left side of the form, under the section DMFT EXAM.

2. In this portion of the survey, first classify each erupted tooth as Permanent (P) or Deciduous (D), then score all 32 possible teeth as Decayed (D), Missing (M), Sound (S), Filled (F), or Crowned (C).

3. Each box in the TOOTH TYPE and DMFT columns is associated with a specific tooth. The tooth number is listed under the first column, labeled TOOTH #.

4. Teeth #4 through #13 and #20 through #29 may be either deciduous or permanent teeth. The examiner must make the distinction in column 2, TOOTH TYPE, by placing a P for a permanent tooth or a D for a deciduous tooth. Bicuspids are considered to correspond to the deciduous molars for charting purposes. Since tooth #1 through #3, #14 through #19, and #30 through #32 can only be classified as permanent teeth, these blocks are shaded.

5. A tooth is considered to be erupted if any portion of the clinical crown has penetrated the oral mucosa.

6. If both a deciduous tooth and its permanent successor can be seen, score the permanent tooth and disregard the deciduous tooth.

7. Score each tooth according to its original tooth number in a 32 tooth mouth. Do not renumber a tooth that has drifted into the position of a missing tooth. Tooth number 1 is always tooth number 1 regardless of position.

8. Supernumerary teeth should be disregarded in the DMFT assessment. If a supernumerary tooth exists, determine the "legitimate" occupant of the space and score it accordingly.

Scoring the Teeth

Decayed Teeth

1. Any tooth with one or more decayed surfaces should be scored as decayed with a "D" regardless of whether or not it has been restored.

2. For this index a tooth is classified only once and a decayed tooth always takes precedence over one filled. A tooth determined to be both decayed and filled must be scored as decayed.

3. The criteria used in making a diagnosis of caries may seem arbitrary and contrary to your clinical training and experience - the DMFT is a conservative exam. It is important that you strictly adhere to these criteria during this portion of the exam.

4. Use the following criteria in making a diagnosis of caries.

a. The presence of gross cavitation is sufficient for the diagnosis of caries. Use the following criteria for teeth with small or incipient lesions.

(1) Pits and fissures on the occlusal, buccal, and lingual surfaces are diagnosed as carious when the explorer catches after insertion with moderate to firm pressure and the catch is accompanied by one or more of the following signs of decay:

(a) Softness at the base of the area.

(b) Opacity adjacent to the area as evidence of undermining or demineralization.

(c) Softened enamel adjacent to the area which may be scraped away with the explorer.

(2) Smooth areas on buccal or lingual surfaces are diagnosed as carious if they are decalcified or if there is a white spot and the area is found to be soft by:

(a) penetration with an explorer.

(b) scraping away the enamel with the explorer.

(3) Proximal surfaces, in areas exposed to direct visual and tactile examination, are judged by the same criteria that apply to smooth surfaces on the buccal and lingual. In areas that cannot be examined directly, a discontinuity in the enamel in which the explorer catches is carious if there is softness. In posterior teeth, visual evidence of undermining under a marginal ridge is <u>not</u> sufficient evidence of a proximal lesion unless a surface break can be entered with the explorer. In the anterior teeth, transillumination can serve as a useful aid in discovering proximal lesions. Ideally, the actual diagnosis of

caries should be confirmed with an explorer, however, clear visualization of a lesion by transillumination can justify a positive diagnosis.

Missing Teeth

Teeth not present at the time of examination will be scored with an "M" regardless of the reason.

Filled Teeth

1. Unless decay is present, any tooth that has one or more restored surfaces must be scored as "F" regardless of the restorative material used or the extent of the filling.

2. A tooth with a defective or missing restoration is scored as filled unless decay is present.

Crowned Teeth

1. Teeth with a stainless steel or cast crown will be scored "C".

2. Crowned teeth with recurrent decay around the margins will be classified as decayed (D).

Sound Teeth

1. If a tooth has no carious lesions or restorations that were placed because of carious lesions, score the tooth as sound by placing "S" in the DMFT column in the box for that tooth.

2. Teeth with no history of decay or prior fillings, that have restorations that were placed only to repair the results of trauma should be marked as sound. Ask the patient and judge the patient's response in light of available clinical evidence.

3. Teeth with no history of decay or prior fillings, having restorations that were placed only for esthetic reasons, should be scored as sound. Again, ask the patient and use your clinical judgement.

TX COLUMNS

TREATMENT NEEDS ASSESSMENT and CLASS 3 ASSESSMENT

Needs Column

1. A treatment plan for each tooth will be recorded in the needs column, under the TX section, on the left side of the form.

2. Each box in the needs column corresponds with a specific tooth. The tooth number is listed in the first column, labeled "TOOTH #" under the DMFT Exam section.

3. Acceptable codes for the NEEDS column are:

0 - No treatment needed.

1 - 1 surface restoration required (not casting)

2 - 2 surface restoration required, (not casting)

3 - 3 surface restoration required, (not casting)

4 - 4 surface restoration required, (not casting)

5 - 5 surface restoration required, (not casting)

6 - Cast gold or porcelain fused to gold restoration required

7 - Extraction required

8 - Space maintenance required (extraction of tooth implied if tooth is present)

9 - Stainless steel crown

4. The choice of a needs code for a tooth need not be consistent with the DMFT score for that tooth. For example, you might indicate the need for a three surface restoration for a tooth that is marked as sound in the DMFT section. Base your choice of codes on your estimate of the best treatment for the tooth.

5. Base your treatment plan on your clinical experience and training. Pick forms of treatment that you feel best meet the patient's needs, as if you were treating a member of your family.

Class 3 Column

1. The CLASS 3 column of the TX section will be used to designate the urgency of the treatment of each individual tooth.

2. Acceptable codes for the CLASS 3 column are:

   8 - Tooth will probably not cause a dental emergency in the next twelve months if not treated. Tooth requires either no treatment or routine care.

   3 - Tooth will probably cause a dental emergency in the next twelve months if left untreated.

In deciding whether to code a tooth as 8 or 3, do not base your decision upon the extent, complexity or importance of the treatment required. Decide solely on the basis of your estimate of the tooth's potential to cause an emergency within 12 months.

ORAL HYGIENE ASSESSMENT

A yes or no response to each of the two questions is required for all subjects.

CLASSIFICATION

Indicate the patient's dental classification according to the definitions in AR 40-3. The definitions of each class are:

CLASS 1 - Requires no dental care.

CLASS 2 - Requires dental care but is unlikely to result in a dental emergency within 12 months if left untreated.

CLASS 3 - Requires dental treatment to correct a dental condition that is likely to cause a dental emergency within 12 months.

CLASS 4 - Requires a dental examination.

In distinguishing between CLASS 2 and CLASS 3 base your decision on the likelihood of a dental emergency and not on the amount, complexity, or difficulty of the dental work required.

Do not use the CLASS 4 category in this study. If your subject refuses the examination, the refusal will be documented on another section of the form.

A patient requiring no treatment other than oral hygiene instruction or prophylaxis should be classified as Class 1. In such cases, be sure to indicate the need for the OHI or prophylaxis in the appropriate sections of the form.

FAMILY DENTAL CARE QUESTIONAIRE

1. How many children under age 21 and living at home are in your family?

_____

2. How many years has it been since this child received any dental care from: (Please round up your answer to the nearest year. For example, if your child saw a civilian dentist 2 months ago for an exam, round 2 months up to 1 year in the block for civilian dentist exam.)

	EXAM	TEETH CLEANING	EMERGENCY CARE	OTHER
MILITARY DENTIST	_____	_____	_____	_____
CIVILIAN DENTIST	_____	_____	_____	_____

3. Has this child ever been treated by a military dentist? (circle appropriate response: Y=YES, N=NO)

Y N

4. Is your family covered by a dental insurance plan? (circle appropriate response: Y=YES, N=NO)

Y N

5. Would you join a dental insurance plan costing $10 a month per family member which would pay for 80% of the cost of cleaning and restorative care such as caps and fillings. (circle appropriate response: Y=YES, N=NO)

Y N

TOOTH #	DMFT EXAM: TOOTH TYPE	DMFT EXAM: DMFT	TX: NEEDS	TX: CLASS	
1	///				(1,3)
2	///				(4,6)
3	///				(7,9)
4					(10,13)
5					(14,17)
6					(18,21)
7					(22,25)
8					(26,29)
9					(30,33)
10					(34,37)
11					(38,41)
12					(42,45)
13					(46,49)
14	///				(50,52)
15	///				(53,55)
16	///				(56,58)
17	///				(59,61)
18	///				(62,64)
19	///				(65,67)
20					(68,71)
21					(72,75)
22					(76,79)
23					(80,83)
24					(84,87)
25					(88,91)
26					(92,95)
27					(96,99)
28					(100,103)
29					(104,107)
30	///				(108,110)
31	///				(111,113)
32	///				(114,116)

ORTHODONTIC ASSESSMENT

DOES THIS CHILD REQUIRE DEFINITIVE ORTHODONTIC CARE?

(Y = YES, N = NO) ___ (117)

ORAL HYGIENE ASSESSMENT

IS ORAL HYGIENE INSTRUCTION REQUIRED?

(Y=YES, N=NO) ___ (118),

IS PROPHYLAXIS REQUIRED? ___ (119)

PATIENT CLASSIFICATION

1 OR 2 OR 3 ___ (120)

DMFT EXAM CODES

TOOTH TYPE	DMFT
P = PERMANENT	D = DECAYED
D = DECIDUOUS	M = MISSING
	F = FILLED
	S = SOUND

TX CODES

NEEDS

0=NO TREATMENT
1=1 SURFACE RESTORED
2=2 SURFACES RESTORED
3=3 SURFACES RESTORED
4=4 SURFACES RESTORED
5=5 SURFACES RESTORED
6=CAST GOLD OR PORCELAIN FUSED TO GOLD RESTORATION REQUIRED
7=EXTRACTION REQUIRED
8=SPACE MAINTENANCE REQUIRED
9=STAINLESS STEEL CROWN REQUIRED

CLASS 3

0=NON-EMERGENCY
3=EMERGENCY WITHIN 12 MOS.

Date

Department of the Army
Local Dental Service
Fort _____

To the parents of _____:

During a dental screening examination conducted at _____ School, your child was found to have the following dental problems:

_____ decayed teeth
_____ need for teeth cleaning
_____ need for orthodontic care
_____ need for a space maintainer

We advise that dental care be sought to correct these problems:

_____ immediately
_____ as soon as possible

_____
Examination Officer

TO BE COMPLETED BY THE RECORDER ONLY

EXAMINER'S LAST FOUR SSN: ___ ___ ___ ___ (121-124)

EXAMINATION CODE:

1= EXAMINED
2= REFUSED EXAM
3= NO CONSENT
4= MED HX

___ (125)

SEX:(F=FEMALE,M=MALE) ___ (126)

AGE: ___ ___ (127,128)

ETHNIC GROUP:

1= BLACK
2= WHITE
3= OTHER

___ (129)

FAMILY DENTAL CARE QUESTIONAIRE

1. How many children under age 21 and living at home are in your family?

___ ___ (130,131)

2. How many years has it been since this child received any dental care from: (Please round UP your answer to the nearest year. For example, if your child saw a civilian dentist two months ago for an exam, round two months UP to "01" year in the block for civilian dentist exam.) (Two-Digits)

	EXAM	TEETH CLEANING	EMERGENCY CARE	OTHER	
MILITARY DENTIST	___ ___	___ ___	___ ___	___ ___	(132-139)
CIVILIAN DENTIST	___ ___	___ ___	___ ___	___ ___	(140-147)

3. Has this child ever been treated by a military dentist? (Y=YES, N=NO)

___ (148)

4. Is your family covered by a dental insurance plan? (Y=YES, N=NO)

___ (149)

5. Would you join a dental insurance plan costing $10 a month per family which would pay for 80% of the cost of cleaning and restorative care such as caps and fillings? (Y=YES, N=NO)

___ (150)

CASE # ___ (151-154)

GENERAL INSTRUCTIONS

1. No radiographs will be used for this exam. If you will be using radiographs to examine your patient, complete this survey prior to reading the films.

2. No special health history is provided for this survey. Update the health history in the patient's dental record. You may have to exclude some patients from the survey due to present or past medical conditions. Examples might be patients who must have antibiotic prophylaxis prior to examination or patients with active infectious diseases. If you do exclude a patient for such reasons, leave the clinical portion of the form blank and answer all of the questions on the reverse side.

3. Have adult family members sign the consent statement, question 7, on the non-clinical side of the form. With adults the consent is for the data to be used as part of a study, not for you to do the exam. If an adult refuses consent, note the refusal on the form and stop collecting data on that patient. Do not coerce the patient to consent; cooperation in this survey is not a precondition for other dental services.

4. For children over 14, check for the parent's consent prior to the examination. Do not examine any minor without parental consent. Where consent is given, be sure to transfer the answers from the questionnaire on the back of the consent slip to the adult examination form.

5. Do not allow a patient to fill out any portion of this form except for the signature of consent and date.

SELECTION OF ADULT FAMILY MEMBERS

1. The goal of the selection strategy is to ensure that the patients you examine are representative of the adult family member population.

2. Do NOT examine patients presenting with dental emergencies. Limit the examinations to patients presenting for routine exams.

3. If adult family members may report to more than one clinic for routine examinations it is important the examinations are done in all those clinics.

1. In this portion of the survey, score all 32 possible teeth as Decayed, Missing, or Filled.

2. The results of the DMFT exam will be recorded in the first column of the clinical side of the form, labeled DMFT.

3. Each box in the DMFT column is associated with a specific tooth. The tooth number is found immediately to the left of each box. Figure 1 shows a portion of the DMFT column containing boxes for teeth 1 to 4. The box marked with a "D" corresponds to tooth number 3.

	DMFT	TX NEEDS	TX CLASS 3	PERIO NEEDS	PERIO CLASS 3	
1						(1,5)
2						(6,10)
3	D					(11,15)
4						(16,20)

Figure 1.

4. Score each tooth according to its original tooth number in a 32 tooth mouth. Do not renumber a tooth that has drifted into the position of a missing tooth. Tooth number 1 is always tooth number 1, regardless of position. Make your best guess if necessary.

5. Do not score deciduous teeth in the DMFT determination. If a deciduous tooth occupies the space of an unerupted permanent successor, score the permanent tooth as missing and disregard the deciduous tooth. If both are present, score only the permanent tooth.

6. Supernumerary teeth should be disregarded in the DMFT assessment. If a supernumerary tooth exists, determine the "legitimate" occupant of the space and score it accordingly.

Scoring the Teeth

Decayed Teeth

1. Any tooth with one or more decayed surfaces should be scored as decayed with a "D".

2. If a tooth is both filled and decayed, score the tooth as decayed.

3. The criteria used in making a diagnosis of caries may seem arbitrary and contrary to your clinical training and experience - the DMFT is a conservative exam. It is important that you adhere strictly to these criteria during this portion of the exam.

4. Use the following criteria in making a diagnosis of caries.

a. The presence of gross cavitation is sufficient for the diagnosis of caries. Use the following criteria for teeth with small or incipient lesions.

(1) Pits and fissures on the occlusal, buccal, and lingual surfaces are diagnosed as carious when the explorer catches after insertion with moderate to firm pressure and the catch is accompanied by one or more of the following signs of decay:

(a) Softness at the base of the area.

(b) Opacity adjacent to the area as evidence of undermining or demineralization.

(c) Softened enamel adjacent to the area which may be scraped away with the explorer.

(2) Smooth areas on buccal or lingual surfaces are diagnosed as carious if they are decalcified or if there is a white spot and the area is found to be soft by:

(a) penetration with an explorer.

(b) scraping away the enamel with the explorer.

(3) Proximal surfaces, in areas exposed to direct visual and tactile examination, are judged by the same criteria that apply to smooth surfaces on the buccal and lingual. In areas that cannot be examined directly, a discontinuity in the enamel in which the explorer catches is carious if there is softness. In posterior teeth, visual evidence of undermining under a marginal ridge is <u>not</u> sufficient evidence of a proximal lesion unless a surface break can be entered with the explorer. In the anterior teeth, transillumination can serve as a useful aid in discovering proximal lesions. Ideally, the actual diagnosis of caries should be confirmed with an explorer, however, clear visualization of a lesion by transillumination can justify a positive diagnosis.

Missing Teeth

Teeth not present at the time of examination will be scored with an "M" regardless of the reason.

Crowned Teeth

Score with an "C" any tooth restored with a cast gold or porcelain fused to gold restoration unless decay is also present. This includes inlays, partial coverage, and full coverage restorations. If decay is present score the tooth with as decayed.

Filled Teeth

1. Any tooth that has been restored should be scored with an "F" with the following exceptions.

a. If decay is present anywhere on the tooth use "D" for the code.

b. If the tooth has any cast gold restorations and is free of decay, use "C" for the code.

c. If the tooth was restored solely for esthetic purposes or to repair the result of trauma, use "S" for the code. See the following paragraphs on sound teeth.

2. A tooth with a defective or missing restoration is scored as filled unless decay is present.

Sound Teeth

1. If a tooth has no carious lesions or restorations that were placed because of carious lesions, score the tooth as sound by placing "S" in the DMFT column in the box for that tooth.

2. Teeth with no history of decay or prior fillings, that have restorations that were placed only to repair the results of trauma should be marked as sound. Ask the patient and judge the patient's response in light of available clinical evidence.

3. Teeth with no history of decay or prior fillings, that have restorations that were placed only for esthetic reasons, should be scored as sound. Again, ask the patient and use your clinical judgement.

4. If you cannot visualize all of a partially erupting third molar, but have no reason to suspect that it is decayed, score the tooth as sound. If it is decayed or restored score the tooth appropriately as described in the preceding paragraphs.

TX COLUMNS

TREATMENT NEEDS ASSESSMENT and CLASS 3 ASSESSMENT

Needs Column

1. The NEEDS column of the section of the form labelled TX will be used to record a treatment plan for each tooth.

2. The tooth number for each box in the NEEDS column is found at the left end of the row in which the tooth is located.

3. Acceptable codes for the NEEDS column are:

    ∅ - No treatment needed.

    1 - 1 surface restoration required (not casting)

    2 - 2 surface restoration required, (not casting)

    3 - 3 surface restoration required, (not casting)

    4 - 4 surface restoration required, (not casting)

    5 - 5 surface restoration required, (not casting)

    6 - Cast gold or porcelain fused to gold restoration

    7 - Extraction

    8 - tooth to be replaced by a fixed partial denture pontic (extraction implied if tooth present)

    9 - tooth to be replaced by a removable partial denture pontic (extraction implied if tooth present)

4. You do not need to make your choice of needs code for a tooth consistent with the DMFT score for that tooth. Base your choice of codes on your estimate of the best treatment for the tooth. For example, you might indicate the need for a three surface restoration for a tooth that is marked as sound in the DMFT section.

5. Base your treatment plan on your clinical experience and training. Pick forms of treatment that you feel best meet the patient's needs, as if you were treating a member of your family.

6. This survey will not capture certain kinds of needs such as endodontic therapy. Do not try to compensate for types of treatment that have no codes by substituting "equivalent" forms of treatment.

7. For teeth that would serve as abutments in proposed fixed partial dentures, indicate the treatment that those teeth would require if the fixed bridge is not done.

3. Figure 2 shows examples of the use of the "8" and "9" needs codes.

a. In figure 2a, a fixed partial denture is treatment planned using teeth 2 and 5 as abutments and replacing 3 and 4 with pontics. Because tooth 3 is present, as indicated by the "D" in the DMFT column, it's extraction is implied by the "8" code. Note that the proposed abutments, teeth 2 and 5, are treatment planned according to their own respective needs as if the fixed partial denture will not be provided. A three surface restoration is proposed for tooth 2 and no restorative treatment is proposed for tooth 5.

b. In figure 2b, a removable partial denture is treatment planned. Tooth 1 is indicated for extraction without replacement by a pontic. Teeth 2 and 3 are coded for replacement by removable partial denture pontics. The extraction of tooth 3 is implied. Tooth 4 is treatment planned for a one surface restoration.

	DMFT	TX NEEDS	TX CLASS 3
1	S	Ø	
2	D	3	
3	D	8	
4	M	8	
5	S	Ø	
6	S	Ø	

2 a

	DMFT	TX NEEDS	TX CLASS 3
1	S	7	
2	M	9	
3	D	9	
4	D	1	
5	S	Ø	
6	S	Ø	

2 b

Figure 2.

Class 3 Column

1. The CLASS 3 column of the TX section will be used to designate the urgency of the treatment of each individual tooth.

2. Acceptable codes for the CLASS 3 column are:

Ø - Tooth will probably not cause a dental emergency in the next twelve months if not treated. Tooth requires either no treatment or routine treatment.

3 - Tooth will probably cause a dental emergency in the next twelve months if left untreated.

3. In deciding whether to code a tooth as 2 or 3, do not base your decision upon the extent, complexity or importance of the treatment required. Decide solely on the basis of your estimate of the tooth's potential to cause an emergency within 12 months.

4. Figure 3 demonstrates the use of class 3 codes. In this example, the use of "3" codes for teeth 1 and 4 indicates that both teeth are likely to cause dental emergencies in the next twelve months unless the indicated treatment in provided.

	DMFT	TX NEEDS	TX CLASS 3
1	S	7	3
2	D	6	Ø
3	D	6	Ø
4	F	3	3
5	F	Ø	Ø
6	S	Ø	Ø

Figure 3.

PERIO COLUMNS

TREATMENT NEEDS ASSESSMENT AND CLASS 3 ASSESSMENT

Needs Column

1. The NEEDS column of the section of the form labelled PERIO will be used to record a simplified periodontal treatment plan for each tooth.

2. The tooth number associated with each box in the NEEDS column is found at the left end of the row in which the box is located.

3. Acceptable codes for the NEEDS column are:

Ø - No treatment by a dentist is necessary. This includes routine prophylactic treatments such a prophy, supragingival scaling, and oral hygiene instruction.

C - Requires scaling, root planing, and/or curettage by a dentist. This implies specific therapy for specific periodontal problem.

S - Requires some form of periodontal surgical procedure.

Class 3 Column

1. The CLASS 3 column of the PERIO section will be used to designate the urgency of the periodontal treatment of each individual tooth.

2. Acceptable codes for the CLASS 3 column are:

Ø - Tooth will probably not cause a dental emergency in the next twelve months if not treated. Tooth requires either no treatment or routine treatment.

3 - Tooth will probably cause a dental emergency in the next twelve months if left untreated.

3. In deciding whether to code a tooth as 2 or 3, do not base your decision upon the extent, complexity or importance of the treatment required. Decide solely on the basis of your estimate of the tooth's potential to cause an emergency within 12 months.

4. Figure 4 shows the use of the PERIO Class 3 codes. The use of the "3" codes for teeth 2 and 3 indicate that they are both likely to cause dental emergencies unless they receive the treatment indicated.

	DMFT	TX NEEDS	TX CLASS 3	PERIO NEEDS	PERIO CLASS 3	
1	M	Ø	Ø	Ø	Ø	(1,5)
2	D	1	Ø	S	3	(6,10)
3	S	Ø	Ø	S	3	(11,15)
4	S	Ø	Ø	S	Ø	(16,20)

Figure 4.

REMOVABLE PROSTHETIC ASSESSMENT

In the boxes provided, indicate the need for a complete or partial denture by placing "1" in the box for the appropriate arch. Put a zero in each unused box.

THIRD MOLAR ASSESSMENT

1. For each of the possible third molars indicate whether or not the tooth is impacted in the column labelled IMPACTED. If the tooth is missing, the correct answer is "N." Indicate the presence or absence of pericoronitis in a similar manner in the column labelled PCOR.

2. Use the diagnosis of impaction for third molars that are prevented from erupting into normal occlusion by bone, or adjacent tooth structure. The presence of an operculum is not sufficient. Since no radiographs will be used in this survey, you must be able to see at least part of the tooth clinically to call it impacted.

3. For a diagnosis of pericoronitis, one or more of the following must be present at the time of examination: pain, suppuration, or swelling. The presence of gingival inflammation around a portion of a third molar is not sufficient.

ANUG ASSESSMENT

1. This section of the form will be used to record the presence or absence of ANUG at the time of examination. For a diagnosis of ANUG to be made, the patient must exhibit at least one frankly necrotic papilla. Severe gingivitis or fetid odor, without necrosis, will not suffice.

2. If ANUG is not present place "Ø" in the box provided. If ANUG is present, record the number of necrotic papillae. Use the number 9 to denote nine or more necrotic papillae.

ORAL HYGIENE ASSESSMENT

1. A yes or no response to each of the two questions is required for all subjects.

2. Do not automatically answer yes to either of these two questions. Base your answers on your clinical assessment of the patient's state of oral hygiene

CLASSIFICATION

1. Indicate the patient's dental classification according to the definitions in AR 40-3. The definitions of each class are:

CLASS 1 - Requires no dental care.

CLASS 2 - Requires dental care but is unlikely to result in a dental emergency within 12 months if left untreated.

CLASS 3 - Requires dental treatment to correct a dental condition that is likely to cause a dental emergency within 12 months.

CLASS 4 - Requires a dental examination.

2. In distinguishing between CLASS 2 and CLASS 3 base your decision on the likelihood of a dental emergency and not on the amount, complexity, or difficulty of the dental work required.

3. Do not use the CLASS 4 category in this study. If your subject refuses the examination, the refusal will be documented on another section of the form.

4. A patient requiring no treatment other than oral hygiene instruction or prophylaxis should be classified in Class 1 for this study. In such cases, be sure to record the need for the oral hygiene instructions or prophylaxis in the appropriate boxes on the form.

GENERAL SURVEY INFORMATION

1. The reverse side of the form is used to collect non-clinical information. All entries must be made by a member of the examination team. DO NOT ALLOW THE PATIENT TO FILL OUT ANY PORTION OF THE FORM EXCEPT TO SIGN AND DATE THE FORM IN THE SPACES PROVIDED.

2. Most of the general questions on the back page of the form are self-explanatory.

3. Choose the code for the box labeled EXAMINATION CODE using the following definitions.

a. EXAMINED. Exam performed. Patient consents to use of the examination data.

b. REFUSED. Patient refuses use of data.

c. MED HX. Patient not examined due to present medical condition or past medical history.

4. For the education code, use a code "5" for an Associate Degree.

5. The answer to question 2 may include time as a dependent child as well as time as a spouse.

6. In answering question 3, round up all the patient's answers to the nearest year. Thus, six months becomes 1 year and 14 months becomes 2 years. Note that each entry should consist of a two digit number such as 00, 01, or 10. The Category "Other" includes all routine types of care such as fillings, extractions, and prosthetics. Figure 5 depicts a subject who has last seen a military dentist for an exam and cleaning between 1 and 2 years ago. The subject was treated by a military dentist on an emergency basis between 8 and 9 years ago, but has received no other forms of treatment from military dentists. This person has seen a civilian dentist for an exam and cleaning within the past year and received other forms of routine treatment between 1 and 2 years ago.

3. HOW MANY YEARS SINCE YOU HAD EACH OF THE FOLLOWING TYPES OF CARE? (ROUND UP TO NEAREST YEAR) (TWO DIGITS)

	EXAM	CLEANING	EMER	OTHER	
MILITARY DENTIST	02	02	09	00	(193-200)
CIVILIAN DENTIST	01	01	00	02	(201-208)

Figure 5.

7. Do not fill in the blocks labelled "Case #" found along the lower left border of the non-clinical side of the form. The case number will be assigned by Dental Studies after the form has been returned.

ADULT FAMILY MEMBER DENTAL NEEDS SURVEY

DMFT	TX NEEDS	TX CLASS 3	PERIO NEEDS	PERIO CLASS 3	
___	___	___	___	___	(1,5)
___	___	___	___	___	(6,10)
___	___	___	___	___	(11,15)
___	___	___	___	___	(16,20)
___	___	___	___	___	(21,25)
___	___	___	___	___	(26,30)
___	___	___	___	___	(31,35)
___	___	___	___	___	(36,40)
___	___	___	___	___	(41,45)
___	___	___	___	___	(46,50)
___	___	___	___	___	(51,55)
___	___	___	___	___	(56,60)
___	___	___	___	___	(61,65)
___	___	___	___	___	(66,70)
___	___	___	___	___	(71,75)
___	___	___	___	___	(76,80)
___	___	___	___	___	(81,85)
___	___	___	___	___	(86,90)
___	___	___	___	___	(91,95)
___	___	___	___	___	(96,100)
___	___	___	___	___	(101,105)
___	___	___	___	___	(106,110)
___	___	___	___	___	(111,115)
___	___	___	___	___	(116,120)
___	___	___	___	___	(121,125)
___	___	___	___	___	(126,130)
___	___	___	___	___	(131,135)
___	___	___	___	___	(136,140)
___	___	___	___	___	(141,145)
___	___	___	___	___	(146,150)
___	___	___	___	___	(151,155)
___	___	___	___	___	(156,160)

CODES

DMFT COLUMN
S=Sound
D=Decayed
M=Missing
F=Filled
C=Crown
Y=Excluded

PERIO NEEDS
0=No Treatment
C=Scaling, Root Planing, and Curettage
S=Surgery

TX NEEDS COLUMN
0=No Treatment
1=1 Surface Restored
2=2 Surfaces Restored
3=3 Surfaces Restored
4=4 Surfaces Restored
5=5 Surfaces Restored
6=Cast Restoration
7=Extraction
8=FX Pros Replacement
9=Rem Pros Replacement

TX AND PERIO CLASS 3 COLUMNS
3 = Emergency in 12 mos
0 = All Others

REMOVABLE PROSTHETIC ASSESSMENT

Complete Dentures Required:

Maxillary (0,1) ___ (161)

Mandibular (0,1) ___ (162)

Partial Dentures Required:

Maxillary (0,1) ___ (163)

Mandibular (0,1) ___ (164)

THIRD MOLARS (Y=Yes, N=No):

	IMPACTED	PCOR	
1	___	___	(165,166)
16	___	___	(167,168)
17	___	___	(169,170)
32	___	___	(171,172)

ANUG ASSESSMENT

ANUG (# of Facilities) ___ (173)

ORAL HYGIENE ASSESSMENT

ORAL HYGIENE INSTRUCTION (Y=Yes, N=No) ___ (174)

PROPHYLAXIS (Y=Yes, N=No) ___ (175)

PATIENT CLASSIFICATION (1 or 2 or 3) ___ (176)

TO BE COMPLETED BY RECORDER ONLY

EXAMINER'S LAST FOUR SSN: ___ ___ ___ ___ (177-180)

EXAMINATION CODE: (1=EXAMINED 2=REFUSED 3=MED HX) ___ (181)

SEX: (F=FEMALE, M=MALE) ___ (182)

AGE: (ON LAST BIRTHDAY) ___ ___ (183,184)

ETHNIC: (1=BLACK 2=WHITE 3=OTHER) ___ (185)

EDUCATION:

1=NO HS
2=SOME HS
3=GED
4=HS GRAD
5=SOME COLLEGE (Less than 4 years)
6=COLLEGE GRADUATE (4 years)
7=GRADUATE DEGREE

___ (186)

PAY GRADE OF SPONSOR (EXAMPLE: PFC=E3) ___ ___ (187,188)

****

ASK PATIENT THE FOLLOWING QUESTIONS:

1. HOW MANY CHILDREN UNDER 21 LIVING AT HOME? ___ ___ (189,190)

2. HOW MANY YEARS A MILITARY FAMILY MEMBER? ___ ___ (191,192)

3. HOW MANY YEARS SINCE YOU HAD EACH OF THE FOLLOWING TYPES OF CARE? (ROUND UP TO NEAREST YEAR) (TWO DIGITS)

	EXAM	CLEANING	EMER	OTHER	
MILITARY DENTIST	___ ___	___ ___	___ ___	___ ___	(193-200)
CIVILIAN DENTIST	___ ___	___ ___	___ ___	___ ___	(201,208)

4. WOULD YOU JOIN AN INSURANCE PLAN COSTING $10 A MONTH PER FAMILY MEMBER WHICH WOULD PAY FOR 80% OF THE COST OF CLEANING AND RESTORATIVE CARE SUCH AS CROWNS (CAPS) AND FILLINGS.

(Y=YES, N=NO) ___ (209)

5. IS YOUR FAMILY COVERED BY ANY DENTAL INSURANCE PLAN?

(Y=YES, N=NO) ___ (210)

6. DO YOU LIVE ON POST? (Y=YES, N=NO) ___ (211)

7. I CONSENT TO THE USE OF THE RESULTS OF MY DENTAL EXAMINATION IN THE ADULT FAMILY MEMBER DENTAL NEEDS SURVEY.

(212-215)

CASE # ___ ___ ___ ___

NAME _____ DATE _____

APPENDIX B

Table 1-1
Percentage Distribution of Selected Sociodemographic Characteristics of the Study Sample

Variable	n	% of Study Sample
AGE		
4-14 yrs.	649	39.5%
15-24 yrs.	467	28.4%
25-44 yrs.	511	31.0%
45+ yrs.	18	1.1%
Total	1647	
SEX		
Males	421	25.6%
Females	1226	74.4%
Total	1647	
RACE		
White	1087	66.9%
Black	366	22.5%
Other	173	10.6%
Total	1626	
RANK of SPONSOR		
E1-E3	74	4.5%
E4-E6	825	50.2%
E7-E9	426	25.9%
O1-O3	115	7.0%
O4-+	117	7.1%
W1-W4	88	5.3%
Total	1645	
EDUCATION		
< 9 years	10	1.2%
9- <12 years	92	11.1%
12 years	360	43.5%
13- <16 years	282	34.1%
16 years +	83	10.0%
Total	827	

Table 2-1

Percentage Distribution of
Extraction or Restoration Requirements:
All Family Members (n=1,647)

Number of Teeth Requiring Restoration or Extraction	Percent of Family Members
0	55.9
1-3	26.2
4-6	9.8
7-9	4.5
10 +	3.6

Table 2-2

Percentage Distribution of Dental
Fitness Classification (n=1647)

Dental Fitness Class	Percent Family Members
1	44.8
2	46.1
3	9.1

Table 2-3

Percentage Distribution of
Extraction or Restoration Requirements:
By Age Group (n=1,627)

Number of Teeth Requiring Restoration or Extraction	Percent Family Members Within Age Groups		
	4-14 yrs.	15-24 yrs.	25-44 yrs.
0	86.1	45.0	28.6
1-3	12.6	26.8	42.9
4-6	1.2	13.5	16.6
7-9	0.0	7.9	6.7
10 +	0.0	6.9	5.3

Table 2-4

Mean Number Of Restorations And Extractions
By Age Group (n=1627)

	Age Group		
Restorations	4-14 yrs.	15-24 yrs.	25-44 yrs.
1 surface	.14	1.31	1.09
2 surface	.06	.50	.63
3 surface	.00	.19	.32
4 surface	.00	.09	.08
5 surface	.00	.01	.03
Crowns	.01	.10	.22
Total	.21	2.20	2.37
Extractions			
Third Molars	.01	.39	.25
Other Teeth	.01	.06	.11
Total	.02	.45	.36

Table 2-5

Percentage Distribution of Oral Hygiene Instruction
and Prophylaxis Needs By Age Group (n=1627)

	Type of Service Needed	
Age Group	Oral Hygiene Instruction (% of family members)	Prophylaxis
4-14	8.3	13.7
15-24	55.3	65.1
25-44	78.7	86.9

Table 2-6

Percentage Distribution of Periodontal Treatment Needs By Age Group (n=978)

Age Group	Type of Periodontal Treatment: Surgery (% of family members)	Type of Periodontal Treatment: Scaling & Root Planing (% of family members)
15-24	.9	13.1
25-44	4.5	33.1

Table 2-7

Percentage Distribution of Impacted Teeth Or Pericoronitis (n=1,052)

Number of Impacted Teeth	Percent Family Members
0	93.2
1	4.3
2	1.8
3	.1
4	.6
Number of Teeth with Pericoronitis	
0	95.7
1	3.0
2	1.3

Table 2-8

Percentage Distribution of Removable Prosthetic Care Needs In Adults (n=812)

Prosthetic Treatment	Percent Family Members
Complete Denture/Maxillary	1.4
Complete Denture/Mandibular	.1
Partial Denture/Maxillary	5.2
Partial Denture/Mandibular	7.8
Any Removable Denture	9.5

Table 2-9

Percentage Distribution of Definitive Orthodontic and Space Maintenance Needs (n=595)

Type of Care	Percent Children
Orthodontic	13.4
Space Maintenance	15.6
Both	2.5

Table 2-10

Percentage Distribution of Dental Fitness Classification By Age Group (n=1,627)

Dental Fitness Class	Age Group		
	4-14 yrs.	15-24 yrs.	25-44 yrs.
1	72.7	38.3	16.4
2	26.7	47.8	68.3
3	.6	13.9	15.3

Table 2-11

Percentage Distribution of Extraction Or Restoration Requirements By Pay Grade Of Sponsor (n=1,626)

Number of Teeth	Pay Grade of Sponsor					
	E1-E3	E4-E6	E7-E9	W1-W4	O1-O3	O4 +
0	17.6	49.6	67.8	73.3	48.7	81.2
1-3	31.1	29.5	22.4	20.9	27.8	15.2
4-6	24.3	10.9	6.4	3.5	13.9	2.7
7-9	13.5	4.6	2.4	2.3	8.7	.9
10+	13.5	5.4	1.0	0.0	.9	0.0

Table 2-12

Mean Number of Restorations and Extractions
By Pay Grade of Sponsor (n=1,645)

	Pay Grade of Sponsor					
Restorations	E1-E3	E4-E6	E7-E9	W1-W4	O1-O3	O4 +
1 surface	2.30	.91	.48	.31	.89	.19
2 surfaces	.96	.45	.24	.15	.33	.12
3 surfaces	.28	.19	.10	.08	.21	.05
4 surfaces	.24	.06	.02	.03	.03	.03
5 surfaces	.04	.01	.01	0.00	.01	.01
Crowns	.18	.10	.12	.09	.11	.07
Total	4.00	1.72	.96	.66	1.57	.46
Extractions						
Third Molar	.72	.25	.06	.03	.22	.02
Other Teeth	.10	.10	.01	.03	.03	0.00
Total	.82	.35	.07	.06	.25	.02

Table 2-13

Percentage Distribution of Dental
Fitness Classification By Pay
Grade Of Sponsor (n=1,645)

Dental Fitness Class	Pay Grade of Sponsor					
	E1-E3	E4-E6	E7-E9	W1-W4	O1-O3	O4 +
1	12.2	38.3	54.7	61.4	40.9	66.7
2	60.8	49.7	40.1	36.4	53.9	32.4
3	27.0	12.0	5.2	2.2	5.2	.9

Table 3-1

Percentage Distribution of Attitudes Toward DoD-Sponsored Family Member Dental Insurance By Grade Of Sponsor (n=2,437)

	Pay Grade of Sponsor					
Attitude	E1-E3	E4-E6	E7-E9	W1-W4	O1-O3	O4 +
Favorable	58.1	37.4	34.4	46.2	39.5	34.3
Unfavorable	41.9	62.6	65.6	53.8	60.5	65.7

Table 3-2

Percentage Distribution of Attitudes Toward DoD-Sponsored Family Member Dental Insurance By Family Size (n=2,419)

	Number of Children		
Attitude	0 (%)	1-2 (%)	3 + (%)
Favorable	55.8	42.7	26.6
Unfavorable	44.2	57.3	73.4

Table 3-3

Percentage Distribution of Attitudes Toward The DoD Family Member Dental Insurance Proposal By Treatment Needs (n=1,549)

	Number of Teeth Requiring Restorations or Extractions				
Attitude	0 (%)	1-3 (%)	4-6 (%)	7-9 (%)	10 + (%)
Favorable	32.6	51.2	57.4	54.9	55.9
Unfavorable	67.4	48.8	42.6	45.1	44.1

Table 3-4

Percentage Distribution of Attitudes Toward the DoD Family Member Dental Insurance Proposal By Dental Fitness Classification (n=1,569)

	Dental Fitness Class		
Attitude	1 (%)	2 (%)	3 (%)
Favorable	31.6	48.7	59.3
Unfavorable	68.4	51.3	40.7

Table 3-5

Percentage Distribution of Attitudes Toward The DoD Family Member Insurance Proposal By Pay Grade Of Sponsor at Child and Youth Study Sites (n=1,617)

	Pay Grade of Sponsor					
Attitude	E1-E3	E4-E6	E7-E9	W1-W4	O1-O3	O4 +
Favorable	-----	27.7	25.5	25.9	26.8	36.9
Unfavorable	-----	72.3	74.5	74.1	73.2	63.1

Table 3-6

Percentage Distribution of Attitudes Toward The DoD Family Member Insurance Proposal By Pay Grade Of Sponsor at Adult Study Sites (n=820)

	Pay Grade of Sponsor					
Attitude	E1-E3	E4-E6	E7-E9	W1-W4	O1-O3	O4 +
Favorable	58.1	54.0	65.0	69.2	58.6	51.4
Unfavorable	41.9	46.0	35.0	30.8	41.4	48.6

Table 3-7

Percentage Distribution of Attitudes Toward the DoD Family Member Dental Insurance Proposal By Family Size at Child and Youth Study Sites (n=1,600)

	Family Size (Number of Children)		
Attitude	0 (%)	1-2 (%)	3 + (%)
Favorable	-----	32.6	22.7
Unfavorable	-----	67.4	77.3

Table 3-8

Percentage Distribution of Attitudes Toward the DoD Family Member Dental Insurance Proposal By Family Size at Adult Study Sites (n=819)

	Family Size (Number of Children)		
Attitude	0 (%)	1-2 (%)	3 + (%)
Favorable	55.8	60.8	47.5
Unfavorable	44.2	39.2	52.5

Table 4-1

Percentage Distribution of Interval Since Last Dental Examination By Age Group (n=2,526)

Interval Since Last Exam	Age Group		
	4-14 yrs.	15-24 yrs.	25-44 yrs.
0-1 yrs.	82.9	59.4	23.3
2-5 yrs.	16.1	32.0	38.5
6-9 yrs.	1.0	6.3	18.0
10 + yrs.	0.0	2.3	20.2

Table 4-2

Percentage Distribution of Interval Since Last Dental Examination By Pay Grade Of Sponsor (n=2,514)

Pay Grade of Sponsor	Interval Since Last Dental Exam (years) 0-1 (%)	2-5 (%)	6-9 (%)	10 + (%)
E1-E3	46.0	37.8	10.8	5.4
E4-E6	63.5	25.5	7.0	4.1
E7-E9	68.8	21.1	4.6	5.5
W1-W4	75.2	16.3	0.0	8.5
O1-O3	44.4	43.1	8.3	4.2
O4 +	71.9	21.4	3.3	3.3

Table 4-3

Percentage Distribution of Interval Since Last Dental Examination By Pay Grade of Sponsor at Child and Youth Study Sites (n=1718)

Pay Grade of Sponsor	Interval Since Last Dental Exam (years) 0-1 (%)	2-5 (%)	6-9 (%)	10 + (%)
E1-E3				
E4-E6	83.0	15.9	1.1	0.0
E7-E9	80.5	17.7	1.6	0.2
W1-W4	87.2	12.8	0.0	0.0
O1-O3	70.2	26.3	3.5	0.0
O4 +	79.2	19.1	1.7	0.0

Table 4-4

Percentage Distribution of Interval Since Last Dental Examination By Pay Grade of Sponsor at Adult Study Sites (n=810)

Pay Grade of Sponsor	Interval Since Last Dental Exam (years) 0-1 (%)	2-5 (%)	6-9 (%)	10 + (%)
E1-E3	46.0	37.8	10.8	5.4
E4-E6	27.8	43.2	17.6	11.4
E7-E9	25.8	34.2	15.5	24.5
W1-W4	16.7	33.3	0.0	50.0
O1-O3	27.6	54.0	11.5	6.9
O4 +	31.2	34.4	12.5	21.9

Table 5-1

Average Treatment Costs Per Child By Category Of Care (n=595)

1985 ADA Fee Percentile	Category of Care: Preventive & Diagnostic ($)	Basic ($)	Basic + Space Maint. ($)	Comprehensive ($)
10	27	5.96	16.15	106.77
25	34	6.89	19.87	181.21
50	42	8.22	26.06	281.52
75	54	9.67	32.65	339.20
90	67	11.35	40.07	383.19
95	80	12.71	46.66	409.68

Table 5-2

Average Treatment Costs Per Youth
By Category Of Care (n=222)

1985 ADA Fee Percentile	Category of Care: Preventive & Diagnostic ($)	Basic ($)	Comprehensive ($)
10	33	7.89	94.31
25	39	8.90	106.42
50	49	11.01	124.12
75	62	13.14	140.97
90	76	15.44	159.97
95	88	17.61	171.72

Table 5-3
Average Treatment Costs Per Adult
By Category Of Care (n=830)

1985 ADA Fee Percentile	Category of Care: Preventive & Diagnostic ($)	Basic ($)	Comprehensive ($)
10	33	74.75	562.23
25	39	88.78	654.07
50	49	108.72	786.39
75	62	129.91	911.79
90	76	157.60	1,059.13
95	88	183.92	1,163.61